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Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
San Diego, CA 92121-1714

EXAMINER

BAYARD, EMMANUEL

ART UNIT PAPER NUMBER

2631

DATE MAILED: 12/15/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/971,903

Applicant(s)

CHALLA ET AL.

Examiner

Emmanuel Bayard

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1 and 4-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Tran U.S.

patent No 6,269,075 B1.

As per claim 1, Tran discloses method of acquiring one or more pilots in a wireless communication system, comprising: searching for peaks in a received signal over a designated code space to provide a set of one or more candidate peaks (see abstract and fig.1 element 18 and col.8, lines 10-67); processing each candidate peak to acquire the candidate peak (see abstract and fig.1 element 16 and col.3, lines 35-67 and col.4, lines 12-20 and col.5, lines 16-17); and performing the searching and processing a plurality of times such that the searching for a next set of candidate peaks is performed in parallel with the processing for a current set of candidate peaks (see fig.1 elements 1-3 or fingers and col.5, lines).

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As per claim 4, The method of Tran does include, wherein the designated code space includes phases for all or a portion of a pseudo-random noise (PN) sequence used to generate a pilot (see abstract and col.1, lines 27-45).

As per claim 5, The method of Tran does include wherein the designated code space is partitioned into a plurality of code segments, and wherein the searching is performed over each code segment (see abstract CDMA or code division and col.1, lines 10-67).

As per claim 6, The method of Tran does include wherein the searching includes detecting for peaks over the designated code space to provide a set of detected peaks, and re-evaluating each detected peak to remove noise peaks and provide the one or more candidate peaks (see col.3, lines 35-67 and col.8, lines 40-67).

As per claim 7, The method of Tran does include wherein the searching is performed by a searcher and the processing is performed by one or more finger processors (see fig.1 element 16 or 1-3).

As per claim 8, The method of Tran does include wherein the processing for each candidate peak in the current set is performed by a respective finger processor and the processing for all candidate peaks in the current set is performed in parallel (see fig.1 and col.6, lines 20-40 and col.8, lines 40-67).

As per claim 9, The method of Tran does include , wherein the searching is performed using a plurality of sets of parameter values for the plurality of times (see fig.1).

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As per claim 10, The method of Tran does include wherein each set of parameter values includes a first value for coherent accumulation of despread samples and a second value for non coherent accumulation of pilot symbols (see col.6, lines 6-19).

As per claim 11, The method of Tran inherently includes, wherein the sets of parameter values having improved pilot detection performance for more likely operating conditions are used first.

As per claims 12-14, The method of Tran does include, wherein the communication system is a CDMA system (see abstract).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-3, 15, 27 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tran U.S. Patent NO 6,269,075 B1 in view of Yamamoto U.S. Patent No 5,966,402.

As per claims 2-3, Tran discloses all the features of the claimed invention except pipelining the searching and processing for different sets of candidate peaks to shorten acquisition time.

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Yamamoto teaches pipelining the searching and processing for different sets of candidate peaks to shorten acquisition time (see col.7, lines 15-20).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Yamamoto into Tran so that a result of the partial correlation is deemed to be a pilot candidate for signal detection in order to improve the quality of the communication as taught by Yamamoto (see col.7, lines 33-38).

As per claim 15, Tran discloses method of acquiring one or more pilots in a wireless communication system, comprising: searching for peaks in a received signal over a designated code space to provide a set of one or more candidate peaks (see abstract and fig.1 element 18 and col.8, lines 10-67); processing each candidate peak to acquire the candidate peak (see abstract and fig.1 element 16 and col.3, lines 35-67 and col.4, lines 12-20 and col.5, lines 16-17); and performing the searching and processing a plurality of times such that the searching for a next set of candidate peaks is performed in parallel with the processing for a current set of candidate peaks (see fig.1 elements 1-3 or fingers and col.5, lines).

However Tran does not teach terminating the searching and processing upon detection of pilot acquisition.

Yamamoto teaches terminating the searching and processing upon detection of pilot acquisition (see col.7, lines 15-20).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Yamamoto into Tran so that a result of the partial correlation is deemed to be a pilot candidate

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for signal detection in order to improve the quality of the communication as taught by Yamamoto (see col.7, lines 33-38).

As per claims 27 and 33, Tran teaches all the features of the claimed invention except terminate pilot acquisition upon detection of successful pilot acquisition.

Yamamoto teaches terminating the searching and processing upon detection of pilot acquisition (see col.7, lines 15-20).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Yamamoto into Tran so that a result of the partial correlation is deemed to be a pilot candidate for signal detection in order to improve the quality of the communication as taught by Yamamoto (see col.7, lines 33-38).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

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6. Claims 16, 18, 20-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Van stralen et al U.S. Patent NO 6,621,855 B1.

As per claim 16, Van Stralen teaches method of acquiring one or more pilots in a wireless communication system, comprising: partitioning a range of possible frequency errors for the pilots into a plurality of frequency bins (see col.1, lines 39-43); correlating is considered as the claimed (evaluating) each of the frequency bins to acquire the one or more pilots (see fig.1 element 30 col.1, lines 45-60 and col.2, lines 10-15 and col.5, lines 27-40 and col.6, lines 1-5).

As per claim 18 Van Stralen teaches , wherein the evaluating each frequency bin includes frequency translating data samples derived from a received signal to an approximate center of the frequency bin, searching for peaks in the received signal, based on the frequency-translated data samples, over a designated code space to provide a set of one or more candidate peaks, and processing each candidate peak to acquire the candidate peak (see col.1, lines 43-67 and col.5, lines 29-37 and col.6, lines 1-5).

As per claim 20 Van stralen does include, wherein the searching for a next frequency bin is performed in parallel (see fig.1 elements 16-16x) with the processing for a current frequency bin.

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As per claim 21 Van Stralen would include wherein the searching includes detecting for peaks over the designated code space to provide a set of detected peaks, and re-evaluating each detected peak to remove noise peaks as to improve the quality of the communication system.

As per claim 22, Van Stralen does include wherein the designated code space includes phases for all or a portion of a pseudo-random noise (PN) sequence (see fig.1 elements 16-16x and col.2, lines 65-67) used to generate a pilot.

As per claim 23, Van Stralen does include, wherein the searching is performed by a searcher and the processing for each candidate peak in a particular set is performed by a respective finger processor, and wherein the processing for all candidate peaks in the set are performed in parallel (see figs.1-5 and col.1, lines 39-50 and col.3, lines 21-67).

As per claim 24 Van Stralen inherently includes wherein the frequency bins overlap

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 17, 19, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Stralen U.S. Patent No 6,621,855 in view of Yamamoto U.S. Patent NO 5,966,402.

As per claim 17, Van Stralen teaches all the features of the claimed invention except terminating the evaluating upon detection of pilot acquisition.

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Yamamoto teaches terminating the evaluation upon detection of pilot acquisition (see col.7, lines 15-20).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Yamamoto into Van Stralen so that a result of the partial correlation is deemed to be a pilot candidate for signal detection in order to improve the quality of the communication as taught by Yamamoto (see col.7, lines 33-38).

As per claim 19, Van stralen does not teach pipelining the searching and processing for different frequency bins to shorten acquisition time.

Yamamoto teaches terminating the evaluation upon detection of pilot acquisition (see col.7, lines 15-20) is functionally equivalent to the claimed shorten the acquisition time.

It would have been obvious to one of ordinary skill in the art to implement the teaching of Yamamoto into Van Stralen so that a result of the partial correlation is deemed to be a pilot candidate for signal detection in order to improve the quality of the communication as taught by Yamamoto (see col.7, lines 33-38).

As per claim 25, Van Stralen teaches a method of acquiring one or more pilots in a CDMA communication system, comprising: partitioning a range of possible frequency errors for the pilots into a plurality of frequency bins (see col.1, lines 39-43); correlating is considered as the claimed (evaluating) each of the frequency bins to acquire the one or more pilots (see fig.1 element 30 col.1, lines 45-60 and col.2, lines 10-15 and col.5, lines 27-40 and col.6, lines 1-5); down conversion is the same as the claimed (frequency translating data samples) (see figs.1, 5

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elements 26, 526 and col.3, lines 14-16) derived from a received signal to an approximate center of the frequency bin, searching for peaks in the received signal, based on the frequency-translated data samples, over a designated code space to provide a set of one or more candidate peaks, processing each candidate peak to acquire the candidate peak (see col.1, lines 39-45 and col.6, lines 1-5); and pipelining the searching and processing for different frequency bins such that the searching for a next frequency bin is performed in parallel with the processing for a current frequency bin (see col.1, lines 39-45 and col.5, lines 28-67 and col.6, lines 1-5).

Van Stralen does not teach terminating the evaluating upon detection of pilot acquisition.

Yamamoto teaches terminating the evaluation upon detection of pilot acquisition (see col.7, lines 15-20).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Yamamoto into Van Stralen so that a result of the partial correlation is deemed to be a pilot candidate for signal detection in order to improve the quality of the communication as taught by Yamamoto (see col.7, lines 33-38).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

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(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

10. Claims 26, 30-32 and 36-37 are rejected under 35 U.S.C. 102(e) as being anticipated by

Tran U.S. Patent No 6,269,075 B1.

As per claims 26 and 32, Tran teaches a demodulator in a wireless communication system, comprising: a searcher operative to search for peaks in a received signal over a designated code space to provide a plurality of sets of one or more candidate peaks (see abstract and fig.1 element 18 and col.8, lines 10-67); and one or more finger processors operative to process at least one of the plurality of sets of one or more candidate peaks to acquire the candidate peaks, wherein the one or more finger processors are operated in parallel with the searcher such that the finger processors process a current set of candidate peaks while the searcher searches for a next set of candidate peaks (see abstract and fig.1 element 16 and col.3, lines 35-67 and col.4, lines 12-20 and col.5, lines 16-17 and fig.1 elements 1-3 or fingers).

As per claims 30 and 36 the demodulator of Tran does include wherein each finger processor includes a frequency control loop operative to acquire the frequency of a candidate peak assigned to the finger processor (see fig.1 element 52).

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As per claims 31 and 37, the demodulator of Tran does includes, wherein the designated code space includes phases for all or a portion of a pseudo-random noise (PN) sequence (see fig.1 PN generators) used to generate a pilot

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 28-29 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tran U.S. Patent No 6,269,075 B1 in view of Van Stralen U.S. patent No 6,621,855 B1.

As per claims 28 and 34 Tran teaches all the features of the claimed invention except the demodulator of claim 26, wherein the searcher is operative to search for the next set of candidate peaks in a next bin of frequency errors while the one or more finger processors are operative to process the current set of candidate peaks found for a current bin of frequency offset.

Van Stralen teaches wherein the searcher is operative to search for the next set of candidate peaks in a next bin of frequency errors while the one or more finger processors are operative to process the current set of candidate peaks found for a current bin of frequency offset. (see col.1 , lines 39-45 and col.5, lines 25-67 and col.6, lines 1-5).

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It would have been obvious to one of ordinary skill in the art to implement the teaching of Van into Tran as to calculate the maximum response from the corresponding on of the frequency bin having the greatest absolute values as taught by Van (see col.5, lines 60-67 and col.6, lines 1-5).

As per claims 29 and 35, Tran does include the demodulator of claim 28, wherein the searcher and one or more finger processors each includes demodulator operative to down convert is functionally equivalent to the claimed (a rotator operative to frequency translate) data samples derived from the received signal. Furthermore implementing such teaching to an approximate center of the bin being operated on by the searcher or finger processor into Tran would have been obvious to one skill in the art as to calculate the maximum response from the corresponding on of the frequency bin having the greatest absolute values as taught by Van (see col.5, lines 60-67 and col.6, lines 1-5).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kelton et al U.S. Patent No 5,926,503 teaches a DS-CDMA receiver.

Marchok et al U.S. patent No 5,995,483 teaches a method and apparatus for upstream clock synchronization.

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Patrick et al U.S. patent no 6,522,871 B1 teaches method and apparatus for compensating local oscillator.

Kondo U.S. Patent no 6,178,193 B1 teaches a spread spectrum receiver.

Ono U.S. patent No 6,272,167 B1 teaches a spread spectrum communication system.

Sanderford, Jr et al U.S. Patent NO 6,111,911 teaches a direct sequence frequency.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is (703) 308-9573. The examiner can normally be reached on Monday-Thursday from 8:00 AM - 5:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour, can be reached on (703) 306-3034. The fax phone number for this Group is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3800.



Emmanuel Bayard

Primary Examiner

December 11, 2003